AY11 Continuous Process Improvement for Strategic Leaders
IP04

Department of Leadership and Strategy

We Produce the Future

Col PJ McAneny
AWC/DA

Plan for the Day

- **1st Hour – Brief Admin/Short Video Presentation/Review the Concepts of 6S and Visual Management**

- **2nd Hour – Discussion Questions from Readings (Galsworth Video – Time Permitting)**

- **3rd Hour – ABC Simulation Exercise**

ADMIN DISCUSSION

- Case Study Analysis
  - Use the IP#8 scope sheet as a guide
  - Probably need to be doing research now if you don't have a topic
  - All students please fill in "Teams and Topic" spreadsheet by the end of class next Wednesday, 1 Sep
  - Drop sheets off in my office prior to class or give them to me during class
- Critical Book Analysis
  - Use the IP10 scope sheet as a guide
- GKN Aerospace Trip – 24 Sep (depart 0730 hrs from AWC parking lot)

Field Trip

- ## **GKN Aerospace**
  - Local firm about 40 minute drive from Maxwell AFB
  - Like USAF a mature organization…but this company had to change culture to survive
  - Easy to see transformation still ongoing

  - When: 24 Sep (IP#9)
    - 0730-1330 hrs including travel time
  - How: POVs
  - Group lunch out after visit if anybody is interested

Course Design

This course is organized in 4 parts:

- History/Current Status (IP01)

- Transformation (IP02 and IP03)

- Tools and Techniques (IP04-IP07)

- Understanding/Applying Transformation Tools of the Trade (IP08-IP10)

Video

AFMC "LG Receiving Video"

- Be on the lookout for examples visual
   management during this short presentation

6S and Visual Management

6S

1. **Sort**
2. **Straighten**
3. **Shine**
4. **Standardize**
5. **Sustain**
6. **Safety**

Description of the Situation

Early in Lean implementation the need for a stable foundation arises. The appropriate response is to establish the fundamental disciplines that will drive the implementation of AFS021 forward. Six S is one of the most important disciplines. The ordering of a work area into a clearly visual managed area where everything has a place, there is a place for everything and the standard established is sustained, requires the use of Six S. The need for Six S is visually determined by asking the most basic questions.

- Is the workplace non-standard or standard?

- Is the placement of materials, equipment and work instructions aimed at reducing waste?

- Can you determine what is important by the visual status of work?

Expected Outcomes

- Discipline in how the workplace is ordered.

- Equating misplacement of materials, information, equipment, etc. as waste.

- Less waste in movement, waiting, and excess inventory.

- Self-maintaining workplace.

Lacking Point of Use, we hunt and forage. We spend hours looking for information someone has already produced or mined. Management has employees scouring (always expedited) for information that, if organized, could be easily accessed by management themselves. Customers (internal and external) wait while we try to locate information or correct pa

6S Overview

- Target Locations
- Benefits
- Preparation
- Personnel Issues
- Safety
- 6 S
  - Sort
  - Straighten
  - Shine
  - Standardize
  - Sustain
  - Safety
- Summary

Target Locations

- Shop Floor and….
- Shipping/Receiving/Storage/Records
- Training Rooms
- Offices, Filing Cabinets, Book Cases, Closets
- Bulletin Boards
- Hard Drives, Shared Drives, Outlook Inboxes
- Common Areas
  - Reception Areas
  - Walls, Signs, and Bulletin Boards
  - Hallways
  - Break Rooms
  - Kitchens
  - Conference Rooms

Benefits

- **Efficiency** – 'the gold standard for 6S is that anyone should be able to find anything in their own workplace in less than 30 seconds, and anywhere else in the workplace in less than 5 minutes...." Charles Skinner, Productivity Inc.

- **Effectiveness** – focusing on Value Added from the Customer perspective – no time is spent on waste - product quality is increased, and productivity is enhanced

- **Organization** – visual workplace, employees can understand status, business unit customers can locate people, office set up for work flow rather than org. chart

Benefits

- **Communication** - between employees and through visual cues

- **Space** – 30% new found space is not uncommon

- **Perception** – " After all, if a company cannot successfully conduct housekeeping activities, it's customers might reasonably assume that it would struggle to deliver even mildly complex products on time."

- **Pride** – most people spend more waking hours in work than at home

- **Culture** – build team work and lean awareness
  - team can not go from "as is" to lean or flow without intermediate step
  - this is the project that can realistically involve everyone and increase awareness to change, if you do not include the entire team you are not transforming, but just doing project management
  - you can not be lean without 6S

Preparation

Building Up to 6S Event - Communicate
- Align with Strategy
- Invoke the Burning Platform
- Provide the WII-FM (what's in it for me)
- Charter
  - Scope/Timeline – part of a larger plan?
  - Target – particular waste(s)?
  - Stakeholders – employees/customers/suppliers
  - Champion – support
  - Logistics
  - Measurements of Success

Preparation

Logistics

- Use Current/Future State Maps if available
- Use Spaghetti Diagrams
- Take "before" pictures
- Have existing/future floor plans available
- Have fun – party like atmosphere – Blue Jean Day
- Prepare:
  - Red Tags – name, date, location, reason for tagging
  - Holding Areas – until dispositioning
  - Recycling Bins – some people will pay you to haul it away
  - Trash Bins – don't be surprised

Preparation

Event Measurement

- Distance/Time saved on Spaghetti Chart
- Square Feet Reclaimed
- Shelves Reclaimed
- Bins of Trash
- Bins of Recyclable Material
- Supplies Relocated for Use (back in circulation)
- A Recent Office 6S event salvaged
  - a room of extra pens, pencils, transparency material, folders, binders, etc
  - 70 ink cartridges
  - over 250 wire file racks
  - desks, filing cabinets, tables, chairs, dozens of cubicles

Personnel Issues

"Production is a rhythm and the rhythm gets upset when workers care only about their individual processes. A poor rhythm has negative impact on inventory and conveyance management which in the end creates more waste, such as the extra time needed to find certain items. By allowing operators to do things their own way, we grant a selfish kind of freedom that hurts everyone in the long run." (5 Pillars of the Visual Workplace)

On the other hand….
- Do not focus on tool boxes and office space only
- Do focus on common areas first, so benefit can be seen
- Do not dictate tool box or office standards at first
- Do allow the work force to create tool box or office standards and other improvements by using 6S goals by using brainstorming techniques

Caution against trashing items to avoid dispositioning

Consider saving a drawer(s) for personal use.

Sort

1. Sort

- the first step in cleaning and organizing things
- review everything in the work area
- keep only what is necessary for work
- only in the quantities you need
- "When in doubt move it out!"
- throw out or trash or recycle paper
- move everything else to a separate, common area
- other's treasure – re-stock or red tag
- unknown – red tag until determination can be made

5 Why's

Visual Red Tag or Surplus

Straighten

2. Straighten or Set in Order

- Organize everything in a work area

- Think visual

  ✓ everything properly identified, labeled, color coded

  ✓ transparent covers, signage, inventory kanban

- Think flow

  ✓ easy access, no reason to stop or move

- Think quick changeover

  ✓ change tasks with little set up time

"A place for everything and everything in its place." Samuel Smiles

Point Of Use

Shine

3. Shine

   - Inspect everything while cleaning
- ✓ floors
- ✓ walls and windows
- ✓ machines
- ✓ tools
- ✓ equipment
- ✓ supplies

Standardize

4.   Standardize

- Make it easy to maintain - simplify

- Fastest, safest, best quality, repeatable steps

- Improve upon the standards

- Recurring 3S

- Prevent regression

  ✓ use scheduled audits, checklists, etc.
  ✓ audit self, cross-functional teams, etc.

Sustain

5. Sustain

- Continue to train and maintain the standards

- Establish a formal system for monitoring the results

- Make needed changes in the standards and provide training that addresses those changes

- Expand to other areas using lessons learned

- Culture change

Safety

6. Safety - ensure no improvement to the workplace is operating in a way that decreases the level of safe operation in the area

- Aisles clear, less clutter and hazards

- Exits marked, "no exits" marked

- Safety equipment
    - ✓ clean
    - ✓ more visible/accessible
    - ✓ easier to inspect

- Error proof hazards

Electronic 6S

Desktop, C Drives, Share Drives, Outlook Folders

0.   Before Picture - Go to Documents, Right Click, Click Properties, Click General Tab, Print Screen

1.   Sort – eliminate un-needed and duplicate files to increase space, access, availability, and improve revision status. Sort by date, name, size… Unsubscribe from un-needed emails. Send less, receive less, Meet, call, or IM. (ref

2.   Straighten – use folders and create short cuts wisely, set up email to folder – use the same organization for drive folders, outlook folders, and paper folders.   **C**ustomer, **O**utputs, **T**eam, **A**dmin

3.   Shine – keep clean and use accessories tool - disk clean up, defragmenter

4.   Standardize - create common drives with revision status, use common doc name for document, develop and communicate an email protocol; back up files

5.   Sustain – create a checklist and audit self and common drive

6.   Safety – maintain security

Summary

- 6S is the first of many tools to implement Lean in any product delivery system

- 6S is a complimentary and coordinated effort to whatever project or initiative any group is undertaking, regardless of stage

- 6S is a basic tool for the elimination of waste, the by product of which is improved efficiency, effectiveness, compliance, organization, space, perception, pride, and culture.

Visual Management

Building Participation Through Shared Information

We Produce the Future

"The Components of the QMI Visual Workplace/Visual Order Video Training System"

- 4.4 minute presentation

Visual Management Objectives

- To use displays and controls to enable an individual to immediately recognize the standard and any deviation from it
- To encourage employee involvement and participation
- To quickly identify normal and abnormal conditions
- To have real information in real time
- To move "Manufacturing Management" from a high level group of people to a jointly shared activity

Situational Awareness provides "the primary basis for subsequent decision making and performance in the operation of complex, dynamic systems..." At its lowest level the operator needs to perceive relevant information (in the environment, system, self, etc.), next integrate the data in conjunction with task goals, and, at its highest level, predict future events and system states based on this understanding.

Endsley, M. R. (1995). Measurement of situation awareness in dynamic systems. *Human Factors, 37,* 65- 84.

Blink

- *"The Power of Thinking Without Thinking"* or

- Choices that seem to be made in an instant – a blink of an eye – aren't as simple as they seems

- Thinking behind the locked door of the unconscious

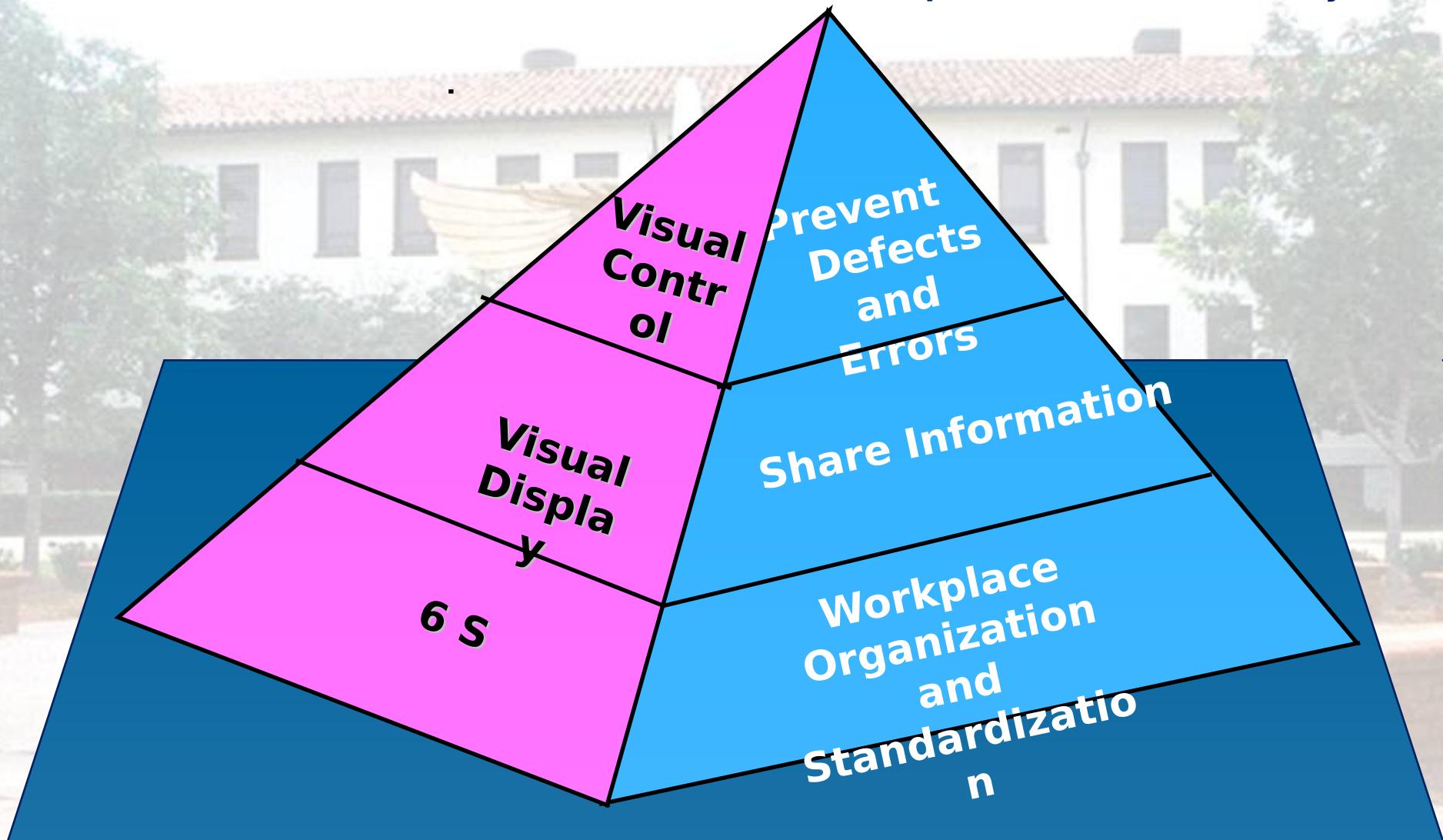- If you get too caught up in the production of information, you drown in the data.

Situational Awareness Can Be Routine

Elements of Visual Management

Visual Control

Visual Display

6 S

Prevent Defects and Errors

Share Information

Workplace Organization and Standardization

Prerequisites for Visual Mgt.

- 6-S
  - 6-S clears clutter and provides organization

- Consistency
  - Visual management is designed to separate normal from abnormal conditions
  - Lack of consistency hides abnormal conditions

- Commitment
  - Management must be willing to share information
  - Everyone must be willing to utilize information

Andon – Abnormal Situation

Alarm Lights and Boards - used to alert appropriate individuals to abnormalities or needs in the work area

- Call for assistance - music and light at station requesting help.

- Current production status and goal

  - Operational Availability
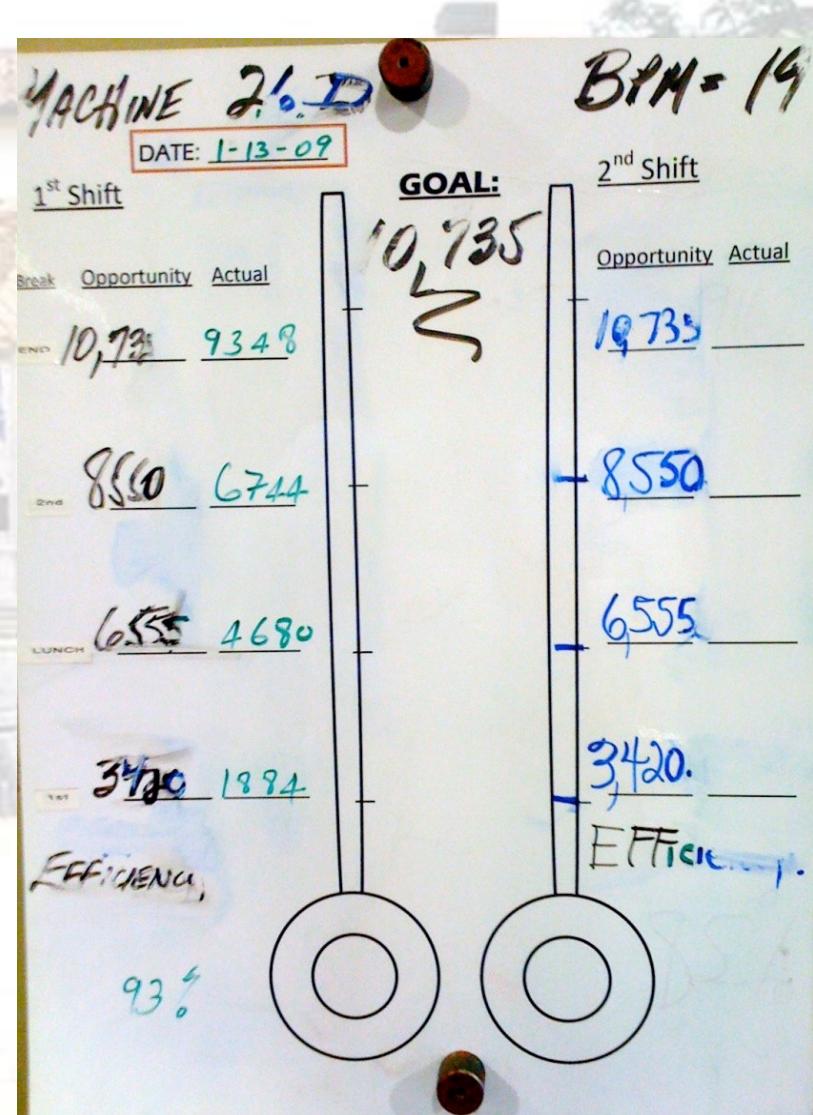
  - Quantity

  - Quality status

Production Visual Displays

- Display boards to indicate current production status

- Data can include production results, line stop causes, operating conditions, etc.

Visual Status

- Create a visual management centre that shows the task broken down into hourly buckets with progress indicated by green / red task

Supervisor writes his start time here and then across the rest of the board

Whole board has red cards showing at start of shift

Current Start Time = 7am	8	9	10	11	12	1300	1400	1500	1600
Name	Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9
Airman 1	Task	Task	Task	Task	Task	Task	Task	Task	Task
Airman 2	Task	Task	Task	Task	Task	Task	Task	Task	Task
Airman 3	Task	Task	Task	Task	Task	Task	Task	Task	Task
Airman 4	Task	Task	Task	Task	Task	Task	Task	Task	Task
Airman	Task	Task	Task	Task	Task	Task	Task	Task	Task

Cards are turned over to green side once task is completed

Airmen have clear visibility of their tasks and their progress against set times

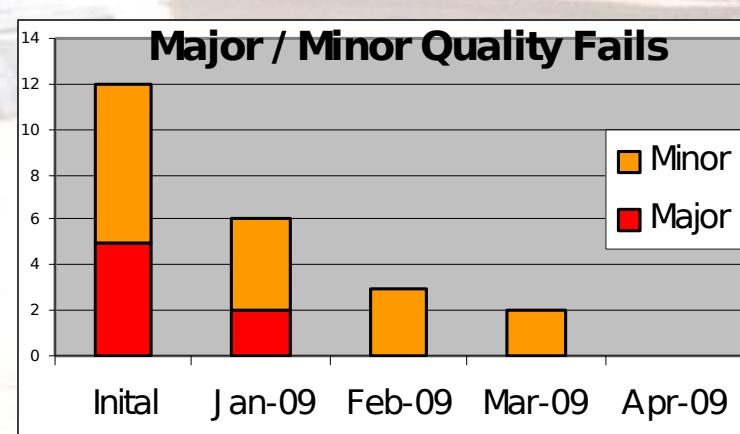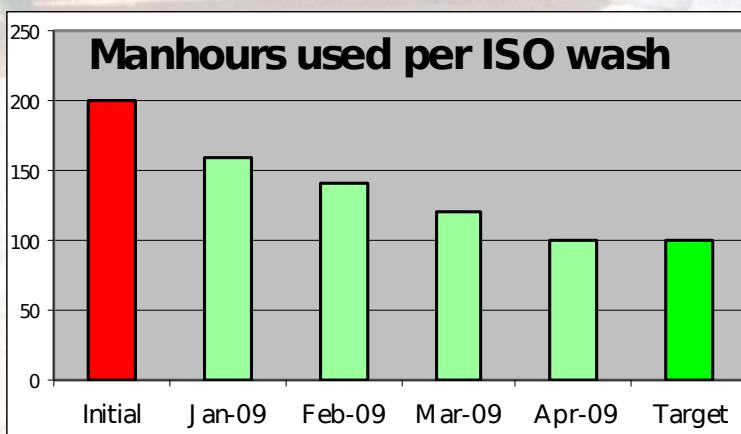Problem with this task is clearly evident to the supervisor and the team

Visual Status

- Visual management centre also provides focal point for end of shift performance reviews and overall Key Performance Indicators

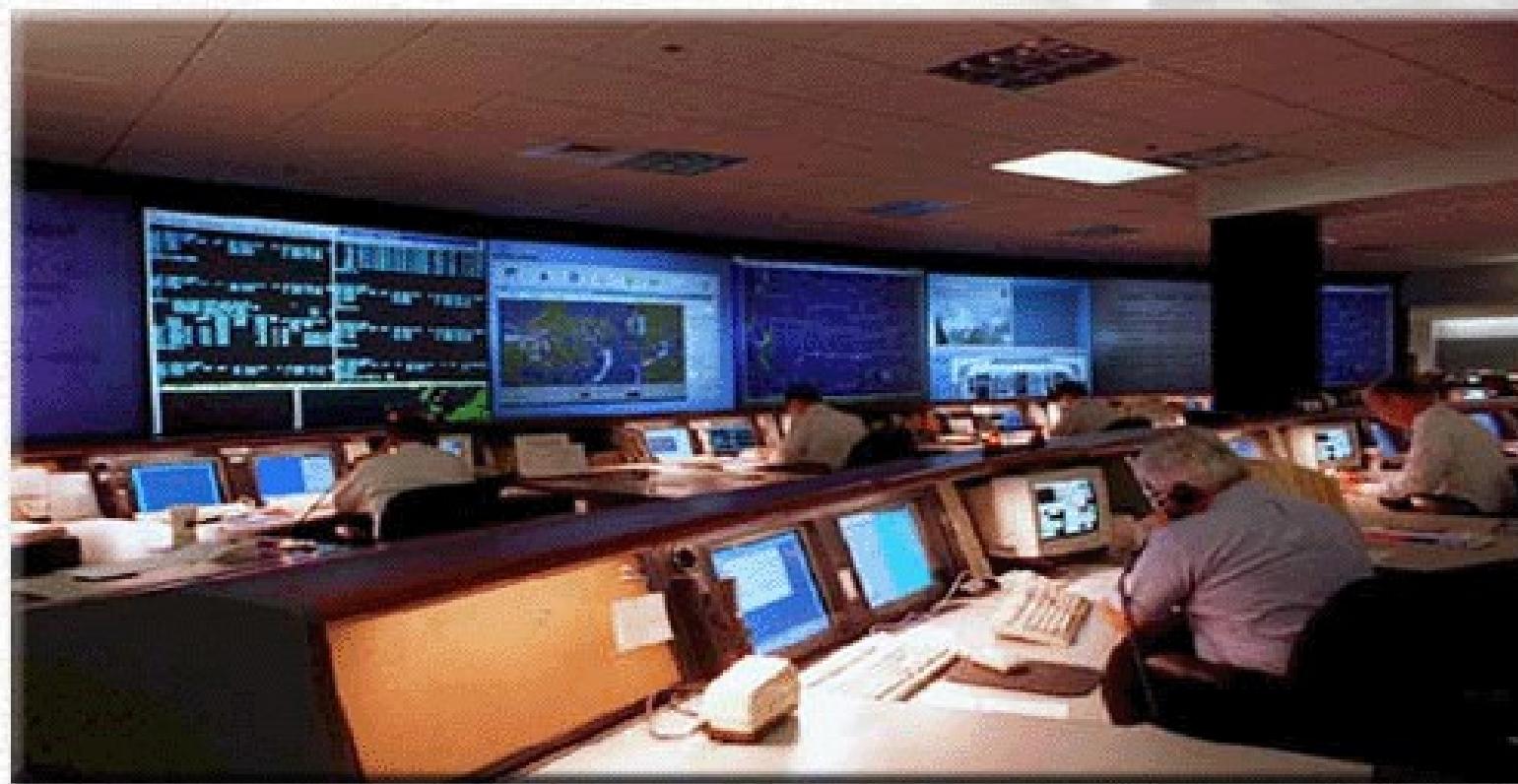| Issues /Countermesasures						
Description	Discrepency	Root Cause	Solution	Due by	POC	Status

Manhours used per ISO wash
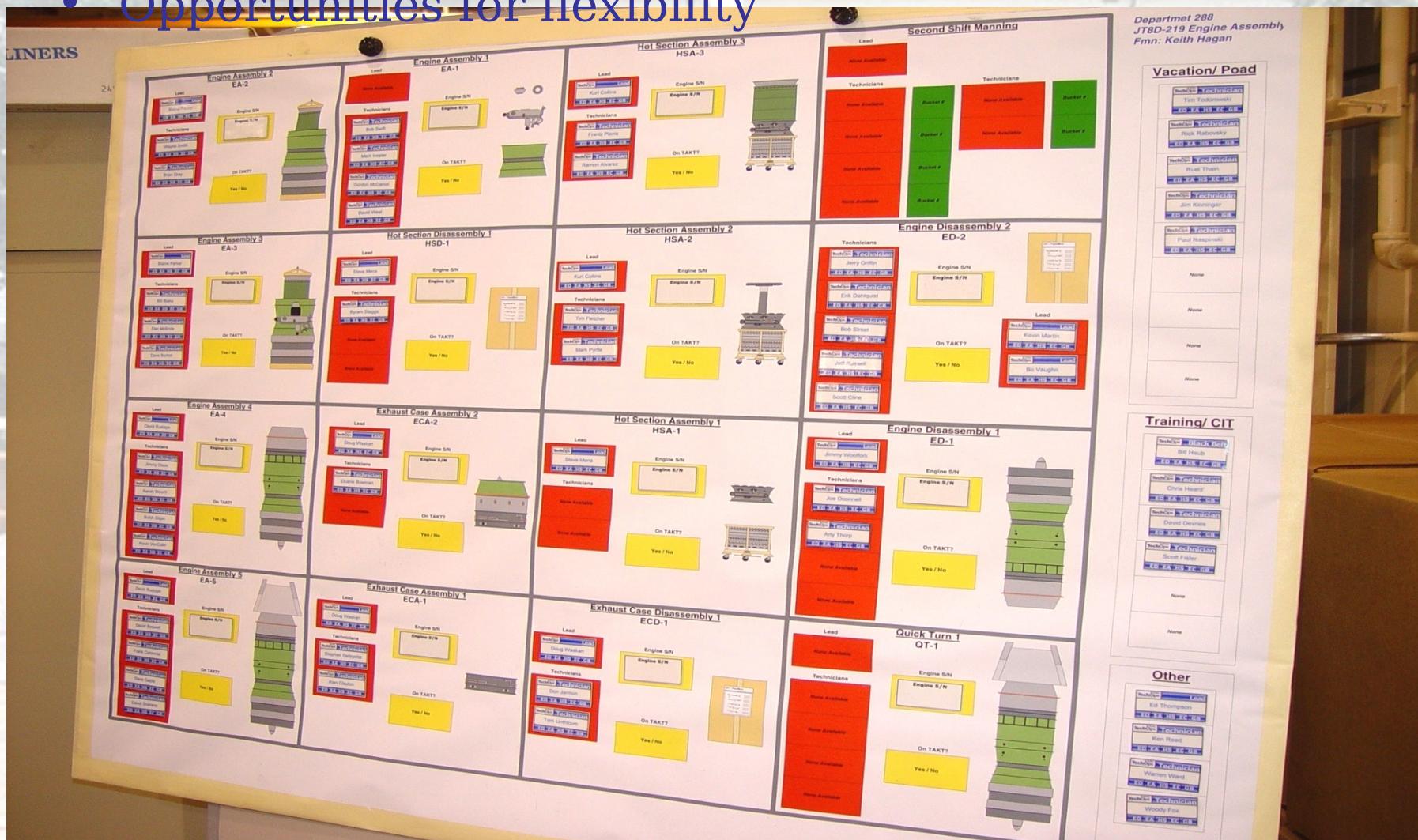
Major / Minor Quality Fails

Visual Operations

Visual Cross Training Matrix

- Displays skill level of each team member per task
- Opportunities for flexibility

Signboard Strategy

- Signs that indicate what belongs where
- Identifies how much should be in a location
- Building navigation
- Safety Indicators
  - Exits
  - Hazards

Visual Compliance

Open / Clear View

- Doors off cabinets
- Low walled cubicles or ce

Kanban - Visual Pull

Before

After

Office Supply Kanban

Questions from the Readings

- What are the two key questions that all visual systems should answer?

- How does Toyota view the relationship between Visual Workplace and Lean? Discuss…

- According to Liker, Toyota has resisted many info-tech trends.
  - Do you agree with Toyota's rationale?
  - What about your organization?

- What about innovate visual info systems you have seen or can imagine in your work area?

6S and Visual Management

- Required fact of life to enable flow
- Simple communication
- Communicates exceptions to standards
- Easily understandable
- Continuously updated
- Provides support for the "value adder"
- Accessible to EVERYONE

The ABC Simulation

IP05
Value Stream Mapping

Backup Slides

Work Place Organization Survey

Workplace Organization – Individual and Common Areas

1. The workplace is un-organized and cluttered. Leaders and employees are located in functional silos. Items needed for work are located haphazardly. Documents cover most individual work areas.

2. Leaders and the employees have removed unnecessary items from the workplace - individual and common areas. Only items necessary to perform work are on hand and in reasonable quantities.

3. Leaders and employees have found a place for everything and everything is in its place. Leaders and employees are situated according to work flow. Items in individual and common areas are identified and easily located to facilitate work flow.

4. All is sorted and set in order. In addition, individual and common areas are clean and portray a professional appearance for customer or visitor and instill a sense of pride for all employees.

5. Workplace organization is a habit for leaders and employees. The leadership and employees have a plan, measurement, and the discipline to maintain it.

Documentation Management Survey

1. There is no central location for work group documentation. Documentation is missing, redundant, and/or out-of-date. Associates maintain personal storage areas. There is no consistent process for document handling.

2. Elimination of outdated, redundant, and unnecessary documentation has begun. A storage area for shared documents has been established but is not always used.

3. No personal storage areas for work group documentation remain. Occasionally, documents are still misplaced, duplicated, and/or lost.

4. All associates in the work group use the central area for work group documents and very seldom is a document misplaced, and/or found to be out-of-date, or in two places at once.

5. Documents are always where they are suppose to be, and they are up to date and accurate. All documents are quickly available to any work group member on demand.

Cleaning and Organization Survey

1. Open space and storage is cluttered with excess and unused equipment, supplies, and papers. There is visible grime, obvious trash (old newspapers, copy machine paper, rejects, etc.), and dust in the work area.

2. A formalized plan to improve Cleaning and Organization (C&O) is being developed. Obvious trash is removed by the end of each day by work group members. Unused equipment and out-of-date materials, supplies, and files (MSF) have been removed.

3. C&O performance is assessed at least twice per week with checklists and visually displayed and reviewed results. MSF are labeled in both the work area and storage areas.

4. Work group members conduct C&O activities during the day. Audits show near-perfect C&O performance. Only rarely is an item out of place. Members begin to plan for optimum placement of MSF.

5. 99.99% C&O performance exists. Work area MSF are stored, labeled, and arranged for optimum ease of use.

Visual Workplace Survey
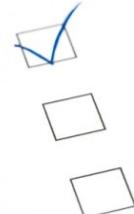
Primary Visual Display

1. There is no primary visual display (PVD), which is a large display in the work area showing the work group's status, metrics, tasks, priorities, and so on, and/or the PVD is not updated regularly.

2. The work group has a PVD and it displays information that is important to the group. The information that is displayed is kept up-to-date most (80%) of the time.

3. The work group PVD is comprehensive and has been extremely improved by the work group members. The information is almost always up-to-date (95% of the time).

4. The PVD contains almost every critical element that the work group must track. Work group members have most of the responsibility for keeping the PVD up-to-date. It is current better than 99% of the time.

5. The PVD display and the performances it tracks are viewed by the work group as the heart and soul of their pride and commitment.